

Remarks

Upon entry of the foregoing amendment, claims 1, 3-5 and 8-10 are pending in the application, with claim 1 being the independent claim. Claims 2, 6 and 7 are cancelled without prejudice to or disclaimer of the subject matter therein. Claims 3-5 and 8 are withdrawn from consideration by the Examiner.

Claims 1, 4 and 8 are amended. Support for amendment to claim 1 can be found in the originally filed claims 1, 2 and 8. Support for amendment to claim 4 can be found in the originally filed claims 3 and 4. Claim 8 is amended so that the language better conforms with U.S. practice.

New claims 9 and 10 are sought to be added. Support for new claims 9 and 10 can be found in the originally filed specification at page 3, lines 6-9; and at pages 8 and 9, the Example. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

I. Rejoinder

Applicants would like to point out that Applicants elected Group I *with traverse* in the Reply to Restriction Requirement dated November 25, 2008.

Upon allowance of elected composition claims (claims 1, 9 and 10) in Group I, Applicants respectfully request rejoinder of method claims (claims 3 and 4) in Group II and process of making claim (claim 8) in Group IV to the elected invention.

II. Objections

Claims 1 and 2 were objected for missing punctuation between the formulas. The amendment to claim 1 and the cancellation of claim 2 herein render this objection moot.

III. Rejection under 35 U.S.C. § 103

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dutzmann *et al.* (U.S. Patent No. 6,306,850 B1) ("Dutzmann"). Applicants respectfully traverse this rejection.

A. Prima Facie Case of Obviousness Has Not Been Established

Dutzmann generally discloses an active compound combination comprising prothioconazole and one or more active compounds selected from 24 groups of listed active compounds, including tebuconazole and fluoxastrobin. (Dutzmann, col. 1, lines 36 through col. 7, line 50.) Dutzmann also specifically discloses several binary combinations, including the combination of prothioconazole and tebuconazole (*see* Dutzmann, cols. 25 and 26, Table 1, 8th entry; cols. 37 and 38, Table 5, 3rd to 5th entries; cols. 41 and 42, Table 6; and cols. 51 and 52, Table 11), and the combination of prothioconazole and fluoxastrobin (*see* Dutzmann, cols. 27 and 28, Table 1, 2nd entry; cols. 31 and 32, Table 3; cols. 39 and 40, 1st and 2nd entries; col. 43 and 44, Table 7; and cols. 45 and 46, Table 8).

The Examiner acknowledged that "the reference [Dutzmann] does not provide any motivation to select the specific combination of the active compounds of formulas (I), (III) and (XIV)." (Office Action, page 4). However, according to the Examiner, "it would be obvious to combine the active compounds of formulas (I), (III) and (XIV) of

Dutzmann *et al.* motivated by the desire to form a synergistic combination effect." (Office Action, page 5.) Applicants respectfully disagree.

Amended claim 1 and new claims 9 and 10 are directed to a synergistic composition containing fluoxastrobin, prothioconazole and tebuconazole, which requires specific ratios of fluoxastrobin to prothioconazole and fluoxastrobin to tebuconazole.

Dutzmann is silent regarding the specific combination of fluoxastrobin, prothioconazole and tebuconazole as required by claims 1, 9 and 10 of the present application. As discussed above, Dutzmann generally discloses an active compound combination comprising prothioconazole and one or more active compounds selected from 24 groups of listed active compounds. Thus, there are hundreds and thousands, if not millions, of possible combinations within Dutzmann's disclosure. There is nothing in Dutzmann that would provide a reason for making the specific combination of fluoxastrobin, prothioconazole and tebuconazole as required by claims 1, 9 and 10 of the present application. In addition, the Examiner has not provided a reason for making a synergistic ternary composition containing fluoxastrobin, prothioconazole and tebuconazole as required by claims 1, 9 and 10 of the present application. The Examiner only generally stated that "it would have [been] obvious to have selected various combination of various disclosed ingredients of active fungicidal compounds from within a prior art disclosure, to arrive at the compositions 'yielding no more than one would expect from such an arrangement.'" (Office Action, page 5.)

Furthermore, the Examiner alleged that Dutzmann disclosed the ratio of prothioconazole to tebuconazole, and the ratio of prothioconazole to fluoxastrobin,

"which encompasses the limitation of claim 2." (Office Action, page 4.) Applicants respectfully disagree.

Dutzmann does not disclose the ratio of fluoxastrobin to tebuconazole as required by claims 1, 9 and 10 of the present application. Rather, Dutzmann discloses the ratio of *prothioconazole to fluoxastrobin* being from 1:0.1 to 1:50, preferably 1:0.2 to 1:20 (see Dutzmann, col. 12, line 22-23),¹ and the ratio of *prothioconazole to tebuconazole* being from 1:0.1 to 1:20, preferably 1:0.2 to 1:10 (see Dutzmann, col. 11, lines 64-65).² Dutzmann is silent regarding the ratio of fluoxastrobin to tebuconazole as required in each of claims 1, 9 and 10 of the present application.

In summary, Dutzmann does not disclose a synergistic ternary composition containing fluoxastrobin, prothioconazole and tebuconazole, nor the ratio of fluoxastrobin to tebuconazole as required by claims 1, 9 and 10 of the present application. Accordingly, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness.

¹ Dutzmann discloses active compound combinations containing 0.1 to 50 parts by weight, preferably 0.2 to 20 parts by weight of active compound of group (13), per part by weight of active compound of the formula (I). (Dutzmann, col. 12, lines 22-23 and lines 49-50.) Active compound of group (13) is fluoxastrobin (see Dutzmann, col. 4, lines 50-65) and active compound of the formula (I) is prothioconazole (see Dutzmann, col. 1, lines 36-53). Thus, Dutzmann discloses the ratio of prothioconazole to fluoxastrobin being from 1:0.1 to 1:50, preferably 1:0.2 to 1:20.

² Dutzmann also discloses active compound combinations containing 0.1 to 20 parts by weight, preferably 0.2 to 10 parts by weight of active compound of group (2), per part by weight of active compound of the formula (I). (Dutzmann, col. 11, lines 61-62; and col. 12, lines 49-50.) Active compound of group (2) is tebuconazole (see Dutzmann, col. 2, lines 9-24.) Thus, Dutzmann discloses the ratio of prothioconazole to tebuconazole being from 1:0.1 to 1:20, preferably 1:0.2 to 1:10.

B. Synergistic Effect

Even assuming, *arguendo*, that a *prima facie* case of obviousness is established, the synergistic effect exhibited by the claimed composition is sufficient to overcome a *prima facie* case of obviousness.

1. Synergistic Effect Presented in the Example

In this study, wheat plants were dusted with spores of *Erysiphe graminis f. sp. Tritici*, and then (48 hours later) sprayed with fluoxastrobin (50.0 g/ha)³, prothioconazole (50.0 g/ha) and tebuconazole (50.0 g/ha) individually and with a preparation of the claimed composition (50.0 g/ha fluoxastrobin + 50.0 g/ha prothioconazole + 50.0 g/ha tebuconazole), wherein the ratio of fluoxastrobin to prothioconazole was 1:1 (50.0 g/ha: 50.0 g/ha), and the ratio of fluoxastrobin to tebuconazole was 1:1 (50.0 g/ha: 50.0 g/ha). The efficacy of fungi control was evaluated 8 days after the inoculation. (The Example on pages 8 and 9 of the specification.)

As shown in the Table on page 9 of the specification, when applied individually, efficacies of 11%, 0% and 22% were observed for fluoxastrobin, prothioconazole and tebuconazole, respectively. However, an efficacy of 100% was observed when the claimed composition was applied. Thus, the efficacy of the claimed composition (100%) was much greater than the sum of the efficacy of fluoxastrobin, prothioconazole and tebuconazole applied individually (11% + 0% + 22% = 33%). Therefore, the claimed composition (fluoxastrobin:prothioconazole=1:1 and fluoxastrobin:tebuconazole=1:1) has a synergistic effect against *Erysiphe graminis f. sp. Tritici* on wheat plants.

³ The unit "g/ha" means gram per hectare.

Moreover, as described in the specification, an alternative way to demonstrate synergy of a given composition containing two or more active fungicidal compounds is by comparing the actual fungicidal activity of the composition to the calculated fungicidal activity according to Colby formula. If the actual fungicidal activity is greater than that calculated, then the composition has a synergistic effect. Specifically, for a composition that contains three active fungicidal compounds, the calculated fungicidal activity is:

$$E_2 = X + Y + Z - \frac{X \bullet Y - X \bullet Z - Y \bullet Z}{100} + \frac{X \bullet Y \bullet Z}{10000}$$

X denotes the efficacy when using active compound A at an application rate of m g/ha, Y denotes the efficacy when using active compound B at an application rate of n g/ha, Z denotes the efficacy when using active compound C at an application rate of r g/ha, E₂ denotes the efficacy when using active compounds A and B and C at application rates of m and n and r g/ha. (Specification at page 6, line 17 through page 7, line 7.)

In the present application, as shown in the Table on page 9 of the specification, the actual efficacy of the claimed composition was 100%, which was much greater than the calculated efficacy of 31% according to Colby formula. Thus, the claimed composition has a synergistic effect against *Erysiphe graminis f. sp. Tritici* on wheat plants.

2. Enhanced Synergistic Effect

The Examiner stated that "Dutzmann et al. disclose an active compound combination with fungicidal activity higher than the sum of the activities of the individual active compounds, therefore present a synergistic effect." (Office Action,

page 4.) The Examiner appeared to take the position that the claimed composition is obvious because Dutzmann disclosed a synergistic combination. Applicants respectfully disagree in view of *In Re Luvisi*, 342 F.2d 102, 144 U.S.P.Q. (BNA) 646 (C.C.P.A. 1965).

In Re Luvisi dealt with the patentability of claims directed to a dustless, free-flowing granule composition, process for preparing granule composition and method of use, comprising a combination of (i) 1-alkyl-3-phenyl substituted urea (*e.g.*, 3-p-chlorophenyl-1,1-dimethyl urea, trade name "CMU"); and (ii) hydrated alkali metal borate, in the ratio of 1:9 to 1:25. 144 U.S.P.Q. at 647-648. The prior art Ryker *et al.* disclosed substituted ureas (including CMU) as herbicides and combinations with another herbicidally active compound (including sodium borates) "to give synergistic herbicidal results." *Id.* at 649. The Board of Patent Appeals and Interferences (BPAI) found that the claims were obvious in view of the prior art references. On appeal, United States Court of Customs and Patent Appeals disagreed and concluded from the evidence that the claimed invention were not obvious. The court held:

We do not accept the notion that every suggestion of synergism in the art coupled with a finding of synergism in the practice of the invention automatically compels a conclusion of obviousness. "Synergism" is a very broad term and means "the combined action of two or more agents * * * that is greater than the sum of the action of one of the agents used alone * * *." Webster's Third New International Dictionary (1961). The definition says nothing at all about how much "greater." Hence, ***a synergistic composition could well be un obvious even though "synergism" is suggested in the prior art.*** For example, the claimed compositions may be many times more synergistic that [sic] any of the prior art compositions.

Id. at 652 (emphasis added).

As shown in the Example on pages 8 and 9 of the specification, a Dutzmann combination (50.0 g/ha fluoxastrobin + 50.0 g/ha prothioconazole) had an efficacy of 44%, which was much lower than 100% of the claimed composition of the present application. Thus, the claimed composition has an enhanced synergistic effect against *Erysiphe graminis f. sp. Tritici* on wheat plants, as compared to at least some of the Dutzmann combinations. Accordingly, the claimed composition is not obvious over Dutzmann.

3. Additional Evidence of Synergistic Effect

Additional results of the claimed composition for other fungi and on other crop have been provided in the Declaration by Dr. Peter Dahmen under 37 C.F.R. § 1.132 submitted herewith. The examples provided in the Declaration describe *Leptosphaeria nodorum* test on wheat plants and *Fusarium graminearum* test on barley plants. These examples present further evidence that the claimed composition has an enhanced synergistic effect in controlling fungi.

(a) *Leptosphaeria nodorum* test

In this study, wheat plants were sprayed with fluoxastrobin (37.5 g/ha), prothioconazole (37.5 g/ha) and tebuconazole (5.0 g/ha) individually and with the preparation of the claimed composition (37.5 g/ha fluoxastrobin + 37.5 g/ha prothioconazole + 5.0 g/ha tebuconazole), wherein the ratio of fluoxastrobin to prothioconazole was 1:1 (37.5 g/ha: 37.5 g/ha) and the ratio of fluoxastrobin to tebuconazole was 1:0.13 (37.5 g/ha: 5.0 g/ha). The wheat plants were then sprayed with a spore suspension of *Leptosphaeria nodorum*. The efficacy of fungi control was evaluated 8 days after the inoculation. (Example 1 in the Declaration.)

As shown in Table 1 in the Declaration, when applied individually, efficacies of 50%, 13% and 0% were observed for fluoxastrobin, prothioconazole and tebuconazole, respectively. However, an efficacy of 100% was observed when the claimed composition was applied. Thus, the efficacy of the claimed composition (100%) was much greater than the sum of the efficacy of fluoxastrobin, prothioconazole and tebuconazole applied individually ($50\% + 13\% + 0\% = 63\%$). Therefore, the claimed composition (fluoxastrobin:prothioconazole=1:1 and fluoxastrobin:tebuconazole=1:0.13) has an enhanced synergistic effect against *Leptosphaeria nodorum* on wheat plants.

In addition, as shown in Table 1 in the Declaration, the actual efficacy of the claimed composition was 100%, which was much greater than the calculated efficacy of 57% according to Colby formula. Therefore, the claimed composition has an enhanced synergistic effect against *Leptosphaeria nodorum* on wheat plants.

Furthermore, as shown in Example 1 in the Declaration, as a comparison, wheat plants were sprayed with a Dutzmann combination (37.5 g/ha prothioconazole + 5.0 g/ha tebuconazole), wherein the ratio of prothioconazole to tebuconazole was 1:0.13 (37.5 g/ha: 5.0 g/ha). The wheat plants were then sprayed with a spore suspension of *Leptosphaeria nodorum*. The efficacy of fungi control was evaluated 8 days after the inoculation. (Example 1 in the Declaration.) As a result, the Dutzmann combination had an efficacy of 50%, which was much lower than 100% of the claimed composition of the present application. Thus, the claimed composition has an enhanced synergistic effect against *Leptosphaeria nodorum* on wheat plants, as compared to at least some of the Dutzmann combinations.

(b) *Fusarium graminearum* test

In this study, barley plants were sprayed with fluoxastrobin (75.0 g/ha), prothioconazole (75.0 g/ha) and tebuconazole (10.0 g/ha) individually and with the preparation of the claimed composition (75.0 g/ha fluoxastrobin + 75.0 g/ha prothioconazole + 10.0 g/ha tebuconazole), wherein the ratio of fluoxastrobin to prothioconazole was 1:1 (75.0 g/ha: 75.0 g/ha) and the ratio of fluoxastrobin to tebuconazole was 1:0.13 (75.0 g/ha: 10.0 g/ha). The barley plants were then sprayed with a spore suspension of *Fusarium graminearum*. The efficacy of fungi control was evaluated 5 days after the inoculation. (Example 2 in the Declaration.)

As shown in Table 2 in the Declaration, the actual efficacy of the claimed composition was 92%, which was much greater than the calculated efficacy of 79% according to Colby formula. Therefore, the claimed composition (fluoxastrobin:prothioconazole=1:1 and fluoxastrobin:tebuconazole=1:0.13) has an enhanced synergistic effect against *Fusarium graminearum* on barley plants.

Furthermore, as shown in Example 2 in the Declaration, as a comparison, barley plants were sprayed with a Dutzmann combination (75.0 g/ha prothioconazole + 75.0 g/ha fluoxastrobin), wherein the ratio of prothioconazole to fluoxastrobin was 1:1 (75.0 g/ha: 75.0 g/ha). The barley plants were then sprayed with a spore suspension of *Fusarium graminearum*. The efficacy of fungi control was evaluated 5 days after the inoculation. (Example 2 in the Declaration.) As a result, the Dutzmann combination had an efficacy of 67%, which was much lower than 92% of the claimed composition of the present application. Thus, the claimed composition has an enhanced synergistic effect

against *Fusarium graminearum* on barley plants, as compared to at least some of the Dutzmann combinations.

In summary, for the reasons set forth, Applicants respectfully submit that the data in the specification and in the accompanying Declaration by Dr. Peter Dahmen demonstrated an enhanced synergistic effect of the claimed composition for controlling fungi. Reconsideration and withdrawal of the outstanding rejection is earnestly solicited.

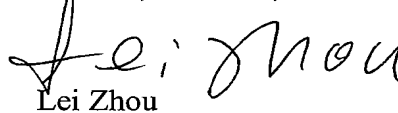
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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